

SEQUENCE LISTING

<110> Donoho, Gregory
Turner, C. Alexander Jr.
Nehls, Michael
Friedrich, Glenn
Zambrowicz, Brian
Sands, Arthur T.

<120> Novel Human Kinase Proteins and
Polynucleotides Encoding the Same

<130> LEX-0046-USA

<150> US 60/156,511

<151> 1999-09-28

<160> 13

<170> FastSEQ for Windows Version 4.0

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<212> DNA

<213> homo sapiens

<400> 1.

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| tgcagaaaca aaacctctgg acaagtagta gctgttaaaa aatttgtgga atctgaagat | 120 |
| gatcctgttg ttaagaaaat agcactaaga gaaatacgta tggttaagca attaaaacat | 180 |
| ccaaatcttg tgaacctcat cgaggtgttc aggagaaaaa ggaaaatgca tttagtttt | 240 |
| gaatactgtg atcatacacact tttaaatgag ctggaaaagaa accccaaatgg agttgctgat | 300 |
| ggagtgatca aaagcgtatt atggcaaaca cttcaagctc ttaatttctg tcataatacat | 360 |
| aactgtattc acagagatataaaacctgaa aatattctaa taactaagca aggaataatc | 420 |
| aagatttgtg acttcgggtt tgccaaaatt ctgagttgga cttcatctt ctctgggcc | 480 |
| tccttgatttgccttaatagt tgaccttctg aattttttt ctgccaattc agagattttt | 540 |
| ctccctggctt ggatccatttgc | 561 |

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<212> PRT

<213> homo sapiens

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Val Val Phe Lys Cys Arg Asn Lys Thr Ser Gly Gln Val Val Ala Val
20 25 30

Lys Lys Phe Val Glu Ser Glu Asp Asp Pro Val Val Lys Lys Ile Ala
 35 40 45

Leu Arg Glu Ile Arg Met Leu Lys Gln Leu Lys His Pro Asn Leu Val
50 55 60

Asp-Lys-Ile-Glu-Val-Phe-Arg-Arg-Lys-Arg-Lys-Met-His-Lys-Val-Phe

ASH Leu Ile Glu Val Phe Arg Arg Lys Arg Lys Met His Leu Val Phe
65 72 75 80

Glu-Tyr-Gly-Asp-His-Thr-Lys-Lys-Asp-Glu-Lys-Glu-Arg-Asp-Pro

| 85 | 90 | 95 |
|---|---------|-----|
| Gly Val Ala Asp Gly Val Ile Lys Ser Val Leu Trp Gln Thr | Leu Gln | |
| 100 | 105 | 110 |
| Ala Leu Asn Phe Cys His Ile His Asn Cys Ile His Arg Asp Ile Lys | | |
| 115 | 120 | 125 |
| Pro Glu Asn Ile Leu Ile Thr Lys Gln Gly Ile Ile Lys Ile Cys Asp | | |
| 130 | 135 | 140 |
| Phe Gly Phe Ala Gln Ile Leu Ser Trp Thr Ser Ser Phe Ser Gly Ala | | |
| 145 | 150 | 155 |
| Ser Leu Ile Gly Leu Ile Val Asp Leu Leu Asn Ser Phe Ser Ala Asn | | |
| 165 | 170 | 175 |
| Ser Glu Ile Phe Leu Leu Ala Trp Ile His Cys | | |
| 180 | 185 | |

<210> 3

<211> 1068

<212> DNA

<213> homo sapiens

<400> 3

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| tgcagaaaaca aaacccctgg acaagtagta gctgttaaaa aatttggaa atctgaagat | 120 |
| gatccctgtt ttaagaaaat agcactaaga gaaatacgta tggtgaagca attaaaacat | 180 |
| ccaaatctt tgaacacct cat cgaggtttc aggagaaaaa ggaaaatgca tttttttttt | 240 |
| gaataactgtg atcatacact tttaatgag ctggaaagaa acccaaattgg agttgctgat | 300 |
| ggagtgtatca aaagcgtt atggcaaaca cttaagctc ttaatttctg tcataatacat | 360 |
| aactgtattt acagagatat aaaacctgaa aatattctaa taactaagca aggaataatc | 420 |
| aagatttggt acttcgggtt tgcacaaattt ctgattccag gagatgccta caccgattat | 480 |
| gtagctacga gatggtaccg agctcctgaa ctttttgtgg gagataactca gtatggttct | 540 |
| tcatgtatca tatggctat tgggtgttt tttcagagc tcctgacagg ccagccactg | 600 |
| tggcctggaa aatcagatgt ggaccaactt tatctgataa tcagaacact agtagagacg | 660 |
| gggttgcgcc atgttgcacca ggctggtctc gaactcttga cgtcaagtga tccacctgcc | 720 |
| gtagcctctc aaagtgtgg aattacagga aaattaatcc caagacatca atcaatctt | 780 |
| aaaagtaacg gttttcca tggcatcagt atacctgagc cagaagacat ggaaactctt | 840 |
| gagaaaaagt tctcagatgt tcatcctgtg gctctgaact tcatgaaggg gtgtctgaag | 900 |
| atgaatccag atgacagatt aacctgttcc caactcctgg agagctccta ctttattct | 960 |
| tttcaagagg cccaaattaa aagaaaagca cgtaatgaag gaagaaacag aagacgccaa | 1020 |
| caggtcagag gctgtgtttt gctgctgcag ctctgctcca ggctgcat | 1068 |

<210> 4

<211> 356

<212> PRT

<213> homo sapiens

<400> 4

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| Val Val Phe Lys Cys Arg Asn Lys Thr Ser Gly Gln Val Val Ala Val | |
| 20 25 30 | |
| Lys Lys Phe Val Glu Ser Glu Asp Asp Pro Val Val Lys Lys Ile Ala | |
| 35 40 45 | |
| Leu Arg Glu Ile Arg Met Leu Lys Gln Leu Lys His Pro Asn Leu Val | |
| 50 55 60 | |
| Asn Leu Ile Glu Val Phe Arg Arg Lys Arg Lys Met His Leu Val Phe | |
| 65 70 75 80 | |
| Glu Tyr Cys Asp His Thr Leu Leu Asn Glu Leu Glu Arg Asn Pro Asn | |

| 85 | 90 | 95 |
|---|-----|-----|
| Gly Val Ala Asp Gly Val Ile Lys Ser Val Leu Trp Gln Thr Leu Gln | | |
| 100 | 105 | 110 |
| Ala Leu Asn Phe Cys His Ile His Asn Cys Ile His Arg Asp Ile Lys | | |
| 115 | 120 | 125 |
| Pro Glu Asn Ile Leu Ile Thr Lys Gln Gly Ile Ile Lys Ile Cys Asp | | |
| 130 | 135 | 140 |
| Phe Gly Phe Ala Gln Ile Leu Ile Pro Gly Asp Ala Tyr Thr Asp Tyr | | |
| 145 | 150 | 155 |
| Val Ala Thr Arg Trp Tyr Arg Ala Pro Glu Leu Leu Val Gly Asp Thr | | |
| 165 | 170 | 175 |
| Gln Tyr Gly Ser Ser Val Asp Ile Trp Ala Ile Gly Cys Val Phe Ala | | |
| 180 | 185 | 190 |
| Glu Leu Leu Thr Gly Gln Pro Leu Trp Pro Gly Lys Ser Asp Val Asp | | |
| 195 | 200 | 205 |
| Gln Leu Tyr Leu Ile Ile Arg Thr Leu Val Glu Thr Gly Phe Arg His | | |
| 210 | 215 | 220 |
| Val Asp Gln Ala Gly Leu Glu Leu Leu Thr Ser Ser Asp Pro Pro Ala | | |
| 225 | 230 | 235 |
| Val Ala Ser Gln Ser Ala Gly Ile Thr Gly Lys Leu Ile Pro Arg His | | |
| 245 | 250 | 255 |
| Gln Ser Ile Phe Lys Ser Asn Gly Phe Phe His Gly Ile Ser Ile Pro | | |
| 260 | 265 | 270 |
| Glu Pro Glu Asp Met Glu Thr Leu Glu Glu Lys Phe Ser Asp Val His | | |
| 275 | 280 | 285 |
| Pro Val Ala Leu Asn Phe Met Lys Gly Cys Leu Lys Met Asn Pro Asp | | |
| 290 | 295 | 300 |
| Asp Arg Leu Thr Cys Ser Gln Leu Leu Glu Ser Ser Tyr Phe Asp Ser | | |
| 305 | 310 | 315 |
| Phe Gln Glu Ala Gln Ile Lys Arg Lys Ala Arg Asn Glu Gly Arg Asn | | |
| 325 | 330 | 335 |
| Arg Arg Arg Gln Gln Val Arg Gly Cys Val Trp Leu Leu Gln Leu Cys | | |
| 340 | 345 | 350 |
| Ser Arg Leu His | | |
| 355 | | |

<210> 5
 <211> 972
 <212> DNA
 <213> homo sapiens

<400> 5

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| tgcagaaaaca aaacctctgg acaagtagta gctgttaaaa aatttgttga atctgaagat | 120 |
| gatcctgttg ttaagaaaat agcactaaga gaaatacgta tggtgaagca attaaaaacat | 180 |
| ccaaatcttg tgaacctcat cgagggtttc aggaaaaaaa ggaaaatgca tttagtttt | 240 |
| gaatactgtt atcatacact tttaaatgag ctggaaaagaa acccaaattgg agttgcttat | 300 |
| ggagtgttca aaagcgtatt atggcaaacca cttcaagtc ttaatttctg tcataatacat | 360 |
| aactgttattt acagagatataaaacctgaa aatattctaa taactaagca aggaataatc | 420 |
| aagatttttg acttcgggtt tgcacaaaatt ctgattccag gagatgccta caccgattat | 480 |
| gtagctacga gatggtaccg agctcctgaa cttttgtgg gagatactca gtatggttct | 540 |
| tcagtcgata tatgggctat tggttgttt tttgcagagc tcctgacagg ccagccactg | 600 |
| tggcctggaa aatcagatgt ggaccaactt tatctgataa tcagaacact agggaaaatta | 660 |
| atccccaaagac atcaatcaat cttttaaaagt aacgggtttt tccatggcat cagttatcac | 720 |
| gagccagaag acatgaaac tcttgaggaa aagtctcag atgttcatcc tggctctg | 780 |
| aacttcatga aggggtgtct gaagatgaat ccagatgaca gattaacctg ttcccaactc | 840 |

ctggagagct cctactttga ttctttcaa gagggccaaa ttaaaagaaa agcacgtaat 900
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tccaggctgc at 972

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<213> homo sapiens

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Val Val Phe Lys Cys Arg Asn Lys Thr Ser Gly Gln Val Val Ala Val
20 25 30
Lys Lys Phe Val Glu Ser Glu Asp Asp Pro Val Val Lys Lys Ile Ala
35 40 45
Leu Arg Glu Ile Arg Met Leu Lys Gln Leu Lys His Pro Asn Leu Val
50 55 60
Asn Leu Ile Glu Val Phe Arg Arg Lys Arg Lys Met His Leu Val Phe
65 70 75 80
Glu Tyr Cys Asp His Thr Leu Leu Asn Glu Leu Glu Arg Asn Pro Asn
85 90 95
Gly Val Ala Asp Gly Val Ile Lys Ser Val Leu Trp Gln Thr Leu Gln
100 105 110
Ala Leu Asn Phe Cys His Ile His Asn Cys Ile His Arg Asp Ile Lys
115 120 125
Pro Glu Asn Ile Leu Ile Thr Lys Gln Gly Ile Ile Lys Ile Cys Asp
130 135 140
Phe Gly Phe Ala Gln Ile Leu Ile Pro Gly Asp Ala Tyr Thr Asp Tyr
145 150 155 160
Val Ala Thr Arg Trp Tyr Arg Ala Pro Glu Leu Leu Val Gly Asp Thr
165 170 175
Gln Tyr Gly Ser Ser Val Asp Ile Trp Ala Ile Gly Cys Val Phe Ala
180 185 190
Glu Leu Leu Thr Gly Gln Pro Leu Trp Pro Gly Lys Ser Asp Val Asp
195 200 205
Gln Leu Tyr Leu Ile Ile Arg Thr Leu Gly Lys Leu Ile Pro Arg His
210 215 220
Gln Ser Ile Phe Lys Ser Asn Gly Phe Phe His Gly Ile Ser Ile Pro
225 230 235 240
Glu Pro Glu Asp Met Glu Thr Leu Glu Glu Lys Phe Ser Asp Val His
245 250 255
Pro Val Ala Leu Asn Phe Met Lys Gly Cys Leu Lys Met Asn Pro Asp
260 265 270
Asp Arg Leu Thr Cys Ser Gln Leu Leu Glu Ser Ser Tyr Phe Asp Ser
275 280 285
Phe Gln Glu Ala Gln Ile Lys Arg Lys Ala Arg Asn Glu Gly Arg Asn
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305 310 315 320
Ser Arg Leu His

<210> 7
<211> 594
<212> DNA

<213> homo sapiens

<400> 7

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| tgcagaaaaca aaacctctgg acaagtagta gctgttaaaa aatttggaa atctgaagat | 120 |
| gatcctgttg ttaagaaaat agcactaaga gaaatacgta tggtgaagca attaaaacat | 180 |
| ccaaatctt gtaacctcat cgaggtttc aggagaaaaa gaaaaatgca tttagtttt | 240 |
| gaatactgtg atcatacact tttaaatgag ctgaaaagaa acccaaattgg agttgctgat | 300 |
| ggagtgtatca aacgcgtatt atggcaaaaca cttcaagctc ttaattctg tcataatcat | 360 |
| aactgtatcc acagagatataa aatattctaa taactaagca agaataatc | 420 |
| aagatttgg acttcgggtt tgcacaaattt ctgagttggc cttcatctt ctctgggcc | 480 |
| tccttgattt gcttaatagt tgaccttctg aattttttt ctgccaattt agagattttt | 540 |
| tccttggctt ggatccattt ctggaaaaattt aatcccaaga catcaatcaa tctt | 594 |

<210> 8

<211> 198

<212> PRT

<213> homo sapiens

<400> 8

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| Met Glu Lys Tyr Glu Lys Leu Ala Lys Thr Gly Glu Gly Ser Tyr Gly | |
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| Val Val Phe Lys Cys Arg Asn Lys Thr Ser Gly Gln Val Val Ala Val | |
| 20 25 30 | |
| Lys Lys Phe Val Glu Ser Glu Asp Asp Pro Val Val Lys Lys Ile Ala | |
| 35 40 45 | |
| Leu Arg Glu Ile Arg Met Leu Lys Gln Leu Lys His Pro Asn Leu Val | |
| 50 55 60 | |
| Asn Leu Ile Glu Val Phe Arg Arg Lys Arg Lys Met His Leu Val Phe | |
| 65 70 75 80 | |
| Glu Tyr Cys Asp His Thr Leu Leu Asn Glu Leu Glu Arg Asn Pro Asn | |
| 85 90 95 | |
| Gly Val Ala Asp Gly Val Ile Lys Ser Val Leu Trp Gln Thr Leu Gln | |
| 100 105 110 | |
| Ala Leu Asn Phe Cys His Ile His Asn Cys Ile His Arg Asp Ile Lys | |
| 115 120 125 | |
| Pro Glu Asn Ile Leu Ile Thr Lys Gln Gly Ile Ile Lys Ile Cys Asp | |
| 130 135 140 | |
| Phe Gly Phe Ala Gln Ile Leu Ser Trp Thr Ser Ser Phe Ser Gly Ala | |
| 145 150 155 160 | |
| Ser Leu Ile Gly Leu Ile Val Asp Leu Leu Asn Ser Phe Ser Ala Asn | |
| 165 170 175 | |
| Ser Glu Ile Phe Leu Leu Ala Trp Ile His Cys Trp Lys Ile Asn Pro | |
| 180 185 190 | |
| Lys Thr Ser Ile Asn Leu | |
| 195 | |

<210> 9

<211> 1041

<212> DNA

<213> homo sapiens

<400> 9

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| tgcagaaaaca aaacctctgg acaagtagta gctgttaaaa aatttggaa atctgaagat | 120 |
| gatcctgttg ttaagaaaat agcactaaga gaaatacgta tggtgaagca attaaaacat | 180 |

| | |
|--|------|
| ccaaatcttg tgaacctcat cgaggtgttc aggagaaaaaa ggaaaatgca ttttagttttt | 240 |
| gaatactgtg atcatacacact tttaaatgag ctggaaagaa acccaaatgg agttgctgat | 300 |
| ggagtgtatca aaagcgattt atggcaaaaca cttcaagctc ttaatttctg tcataatacat | 360 |
| aactgtattc acagagatataaaacctgaa aatattctaa taactaagca aggaataatc | 420 |
| aagatttgcgtt acttcgggtt tgcacaaatt ctgattccag gagatgccta caccgattat | 480 |
| gtagctacga gatggtaccg agctcctgaa cttcttgcgtt gagatactca gtatggttct | 540 |
| tcagtcgata tatgggctat tgggtgtt tttcagagc tcctgacagg ccagccactg | 600 |
| tggcctggaa aatcagatgt ggaccaactt tattctgataa tcagaacact agtagagacg | 660 |
| gggttcgccc atgttgcacca ggctggcttc gaactcttga cgtcaagtga tccacctgccc | 720 |
| gtagcctctc aaagtgcgtt aattacagga aaattaatcc caagacatca atcaatctt | 780 |
| aaaagtaacg gtttttcca tggcatcagt atacctgagc cagaagacat gggaaactctt | 840 |
| gaggaaaaagt tctcagatgt tcattcctgtg gctctgaact tcattgaaggg gtgtctgaag | 900 |
| atgaatccag atgacagatt aacctgttcc caactcctgg agagctcta ctgttgcattct | 960 |
| tttcaagagg cccaaattaa aagaaaagca cgtaatgaag gaagaaacag aagacgccaa | 1020 |
| caggtacttc cgctcaaaag t | 1041 |

<210> 10

<211> 347

<212> PRT

<213> homo sapiens

<400> 10

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| Val Val Phe Lys Cys Arg Asn Lys Thr Ser Gly Gln Val Val Ala Val | |
| 20 25 30 | |
| Lys Lys Phe Val Glu Ser Glu Asp Asp Pro Val Val Lys Lys Ile Ala | |
| 35 40 45 | |
| Leu Arg Glu Ile Arg Met Leu Lys Gln Leu Lys His Pro Asn Leu Val | |
| 50 55 60 | |
| Asn Leu Ile Glu Val Phe Arg Arg Lys Arg Lys Met His Leu Val Phe | |
| 65 70 75 80 | |
| Glu Tyr Cys Asp His Thr Leu Leu Asn Glu Leu Glu Arg Asn Pro Asn | |
| 85 90 95 | |
| Gly Val Ala Asp Gly Val Ile Lys Ser Val Leu Trp Gln Thr Leu Gln | |
| 100 105 110 | |
| Ala Leu Asn Phe Cys His Ile His Asn Cys Ile His Arg Asp Ile Lys | |
| 115 120 125 | |
| Pro Glu Asn Ile Leu Ile Thr Lys Gln Gly Ile Ile Lys Ile Cys Asp | |
| 130 135 140 | |
| Phe Gly Phe Ala Gln Ile Leu Ile Pro Gly Asp Ala Tyr Thr Asp Tyr | |
| 145 150 155 160 | |
| Val Ala Thr Arg Trp Tyr Arg Ala Pro Glu Leu Leu Val Gly Asp Thr | |
| 165 170 175 | |
| Gln Tyr Gly Ser Ser Val Asp Ile Trp Ala Ile Gly Cys Val Phe Ala | |
| 180 185 190 | |
| Glu Leu Leu Thr Gly Gln Pro Leu Trp Pro Gly Lys Ser Asp Val Asp | |
| 195 200 205 | |
| Gln Leu Tyr Leu Ile Ile Arg Thr Leu Val Glu Thr Gly Phe Arg His | |
| 210 215 220 | |
| Val Asp Gln Ala Gly Leu Glu Leu Leu Thr Ser Ser Asp Pro Pro Ala | |
| 225 230 235 240 | |
| Val Ala Ser Gln Ser Ala Gly Ile Thr Gly Lys Leu Ile Pro Arg His | |
| 245 250 255 | |
| Gln Ser Ile Phe Lys Ser Asn Gly Phe Phe His Gly Ile Ser Ile Pro | |
| 260 265 270 | |

| | | | | | | | | | | | | | | | |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| Glu | Pro | Glu | Asp | Met | Glu | Thr | Leu | Glu | Glu | Lys | Phe | Ser | Asp | Val | His |
| 275 | | | | | 280 | | | | | 285 | | | | | |
| Pro | Val | Ala | Leu | Asn | Phe | Met | Lys | Gly | Cys | Leu | Lys | Met | Asn | Pro | Asp |
| 290 | | | | | 295 | | | | | 300 | | | | | |
| Asp | Arg | Leu | Thr | Cys | Ser | Gln | Leu | Leu | Glu | Ser | Ser | Tyr | Phe | Asp | Ser |
| 305 | | | | | 310 | | | | 315 | | | | | 320 | |
| Phe | Gln | Glu | Ala | Gln | Ile | Lys | Arg | Lys | Ala | Arg | Asn | Glu | Gly | Arg | Asn |
| | | | | | 325 | | | 330 | | | | | 335 | | |
| Arg | Arg | Arg | Gln | Gln | Val | Leu | Pro | Leu | Lys | Ser | | | | | |
| | | | | | 340 | | | 345 | | | | | | | |

<210> 11

<211> 945

<212> DNA

<213> homo sapiens

<400> 11

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| tgcagaaaaca | aaacctctgg | acaagttagta | gctgttaaaa | aatttgtgga | atctgaagat | 120 |
| gatcctgttg | ttaagaaaat | agcactaaga | gaaatacgta | tgttgaagca | attaaaacat | 180 |
| ccaaatcttgc | tgaacctcat | cgaggtgttc | aggagaaaaaa | ggaaaatgca | tttagtttt | 240 |
| gaatactgtg | atcatacact | tttaaatgag | ctggaaagaa | acccaaatgg | agttgctgat | 300 |
| ggagtgtatca | aaagcgtatt | atggcaaaca | cttcaagctc | ttaatttctg | tcatatacat | 360 |
| aactgtattc | acagagatata | aaaacctgaa | aatattctaa | taactaagca | aggaataatc | 420 |
| aaagatttgc | acttcgggtt | tgcacaaatt | ctgattccag | gagatgccta | caccgattat | 480 |
| gtagctacga | gatggtaccg | agctcctgaa | cttcttgtgg | gagatactca | gtatggttct | 540 |
| ttagtcgata | tatggctat | tggttgtgtt | tttgcagagc | tcctgacagg | ccagccactg | 600 |
| tggcctggaa | aatcagatgt | ggaccaactt | tatctgataa | tcagaacact | aggaaaatta | 660 |
| atcccaagac | atcaatcaat | cttaaaagt | aacggggttt | tccatggcat | cagtatacct | 720 |
| gagccagaag | acatggaaac | tcttgaggaa | aagttctcag | atgttcatcc | tgtggctctg | 780 |
| aacttcatga | aggggtgtct | gaagatgaat | ccagatgaca | gattaacctg | ttcccaactc | 840 |
| ctggagagct | cctactttga | ttctttcaa | gaggccaaa | ttaaaagaaa | agcacgtaat | 900 |
| gaaggaagaa | acagaagacg | ccaacaggta | cttccgctca | aaagt | | 945 |

<210> 12

<211> 315

<212> PRT

<213> homo sapiens

<400> 12

| | | | | | | | | | | | | | | |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| Met | Glu | Lys | Tyr | Glu | Lys | Leu | Ala | Lys | Thr | Gly | Gly | Ser | Tyr | Gly |
| 1 | | | | | 5 | | | 10 | | 15 | | | | |
| Val | Val | Phe | Lys | Cys | Arg | Asn | Lys | Thr | Ser | Gly | Gln | Val | Val | Ala |
| | | | | | | | | 20 | | 25 | | 30 | | |
| Lys | Lys | Phe | Val | Glu | Ser | Glu | Asp | Asp | Pro | Val | Val | Lys | Lys | Ile |
| | | | | | | | | 35 | | 40 | | 45 | | |
| Leu | Arg | Glu | Ile | Arg | Met | Leu | Lys | Gln | Leu | Lys | His | Pro | Asn | Leu |
| | | | | | | | | 50 | | 55 | | 60 | | |
| Asn | Leu | Ile | Glu | Val | Phe | Arg | Arg | Lys | Arg | Lys | Met | His | Leu | Val |
| | | | | | | | | 65 | | 70 | | 75 | | 80 |
| Glu | Tyr | Cys | Asp | His | Thr | Leu | Leu | Asn | Glu | Leu | Glu | Arg | Asn | Pro |
| | | | | | | | | 85 | | 90 | | 95 | | |
| Gly | Val | Ala | Asp | Gly | Val | Ile | Lys | Ser | Val | Leu | Trp | Gln | Thr | Leu |
| | | | | | | | | 100 | | 105 | | 110 | | |
| Ala | Leu | Asn | Phe | Cys | His | Ile | His | Asn | Cys | Ile | His | Arg | Asp | Ile |
| | | | | | | | | 115 | | 120 | | 125 | | |

| | | | | | | | | | | | | | | | |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| Pro | Glu | Asn | Ile | Leu | Ile | Thr | Lys | Gln | Gly | Ile | Ile | Lys | Ile | Cys | Asp |
| 130 | | | | | | | | | | | | | | | 140 |
| Phe | Gly | Phe | Ala | Gln | Ile | Leu | Ile | Pro | Gly | Asp | Ala | Tyr | Thr | Asp | Tyr |
| 145 | | | | | | | | | | | | | | | 160 |
| Val | Ala | Thr | Arg | Trp | Tyr | Arg | Ala | Pro | Glu | Leu | Leu | Val | Gly | Asp | Thr |
| | | | | | | | | | | | | | | | 175 |
| 165 | | | | | | | | | | | | | | | |
| Gln | Tyr | Gly | Ser | Ser | Val | Asp | Ile | Trp | Ala | Ile | Gly | Cys | Val | Phe | Ala |
| | | | | | | | | | | | | | | | 190 |
| 180 | | | | | | | | | | | | | | | |
| Glu | Leu | Leu | Thr | Gly | Gln | Pro | Leu | Trp | Pro | Gly | Lys | Ser | Asp | Val | Asp |
| | | | | | | | | | | | | | | | 205 |
| 195 | | | | | | | | | | | | | | | |
| Gln | Leu | Tyr | Leu | Ile | Ile | Arg | Thr | Leu | Gly | Lys | Leu | Ile | Pro | Arg | His |
| | | | | | | | | | | | | | | | 220 |
| 210 | | | | | | | | | | | | | | | |
| Gln | Ser | Ile | Phe | Lys | Ser | Asn | Gly | Phe | Phe | His | Gly | Ile | Ser | Ile | Pro |
| | | | | | | | | | | | | | | | 240 |
| 225 | | | | | | | | | | | | | | | |
| Glu | Pro | Glu | Asp | Met | Glu | Thr | Leu | Glu | Glu | Lys | Phe | Ser | Asp | Val | His |
| | | | | | | | | | | | | | | | 255 |
| 245 | | | | | | | | | | | | | | | |
| Pro | Val | Ala | Leu | Asn | Phe | Met | Lys | Gly | Cys | Leu | Lys | Met | Asn | Pro | Asp |
| | | | | | | | | | | | | | | | 270 |
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| Asp | Arg | Leu | Thr | Cys | Ser | Gln | Leu | Leu | Glu | Ser | Ser | Tyr | Phe | Asp | Ser |
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| Phe | Gln | Glu | Ala | Gln | Ile | Lys | Arg | Lys | Ala | Arg | Asn | Glu | Gly | Arg | Asn |
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| Arg | Arg | Arg | Gln | Gln | Val | Leu | Pro | Leu | Lys | Ser | | | | | |
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